

Application No. 09/735,762
Filed: December 13, 2000
Group Art Unit: 1746

REMARKS

Claims 12-19 are pending in the present application. New claims 20-23 have been added. Accordingly, claims 12-23 will be pending upon entry of the instant amendment.

Support for the claim amendments can be found throughout the specification and encompassed by the scope of the claims as originally filed. Support for the new claim 20 can be found, at least, for example, on page 4, lines 26-28. Support for the new claim 21 can be found, at least, for example, on page 11, lines 25-27. Support for the new claim 22 can be found, at least, for example, on page 11, lines 11-13. Support for the new claim 23 can be found, at least, for example on page 4, lines 13-15. No new matter has been added.

Any amendments to the claims should in no way be construed as acquiescence to any of the Examiner's rejections and were done solely to expedite the prosecution of the application. Applicant reserves the right to pursue the claims as originally filed in this or a separate application(s).

Information Disclosure Statement

The Examiner states that the Information Disclosure Statement filed on April 30, 2001, fails to comply with 37 C.F.R. §1.98(a)(3) because it did not include a concise explanation of relevance to the cited non-English publications.

The Chinese publications, CN1179490A, CN1119684A and CN1184178A, were cited as "A" references in the International Search Report of the corresponding international application (PCT/CN00/00578), which indicate the general state of the art and not of particular relevance. Therefore, Applicant will withdraw

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the request for consideration of these Chinese publications by the Examiner.

The German publication 2027003 is directed to a process for cleaning materials using an oil-impregnated cleaning object, specifically oil-impregnated wipes or dust cloths and cleaning cloths. The oil-based cleaning object is made with a petroleum mineral oil.

The scope of the other cited German publications, DE3904513, DE3904514, DE3906724, DE3906735 and DE4004111, is directed to the use of a "supercritical fluid" that is used primarily for cleaning and disinfecting. It is also used for dyeing textile substrates (DE3906724); for bleaching silk, wool, linen and/or cellulose fibre materials (DE3906735); and for removing threads or animal hair from flat textiles (DE4004111).

The English title and abstracts were located on the European Patent Office website ep.espacenet.com for the following German patent applications: DE3904513, DE3904514, DE3906724, DE3906735 and DE4004111. A copy of the abstracts is enclosed herewith. In addition, the title and abstract to the German patent 2027003 and application DE3904514 were translated into English by a commercial translation service, a copy of which is also enclosed. Applicant considers that this satisfies compliance with 37 C.F.R. §1.98(a)(3) and respectfully requests reconsideration of the cited references.

Specification

The Examiner objected to the Abstract for proper language and format and because it exceeded 150 words in length. Applicant encloses a revised Abstract for the Examiner's consideration.

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Claim Rejections - 35 U.S.C. §102

Claims 12-17 and 19 are rejected under 35 U.S.C. §102(a) as being anticipated by Preston et al. (U.S. Patent 5,904,737).

Applicant respectfully traverses the foregoing rejection.

The presently claimed invention is directed to a method of operating a dry-cleaning system, wherein the method comprises using, *inter alia*, liquid carbon dioxide as the cleaning medium. Two storage vessels are used in the method of the invention. A first storage vessel is a reservoir for obtaining vaporized carbon dioxide, or residual solvent, and for equalizing the pressures associated with a cleaning vessel. Therefore, the liquid carbon dioxide in the first storage vessel is not used for bulk transfer to and from the cleaning vessel. The second storage vessel contains the liquid carbon dioxide for use in the cleaning vessel.

In the method of the invention, substrates to be cleaned are disposed into a cleaning vessel. Air and water vapor from the interior of the cleaning vessel is evacuated into the atmosphere (Fig. 1). Pressure is then equalized between the first storage vessel and the cleaning vessel (Fig. 2). The temperature drop resulting from pressure equalization is absorbed by the first storage vessel. A dry-cleaning medium is then transferred from the second storage vessel to the cleaning vessel (Fig. 3). The substrates are then agitated in the cleaning vessel (Fig. 4). After substrate agitation, the liquid dry-cleaning medium is returned from the cleaning vessel to the second storage vessel (Fig. 5), while gaseous dry-cleaning medium is evacuated from the cleaning vessel to the first storage vessel (Fig. 6). To further remove residual carbon dioxide, the internal pressure for the cleaning vessel is raised to atmospheric pressure by admitting air (Fig. 7).

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In the presently claimed method, the pressures in the first storage vessel and the cleaning vessel are equalized. Bulk liquid carbon dioxide is then conveyed from the second storage vessel to the cleaning vessel. Thus, in the method of the invention, pressure equalization is performed using a "cold" or a "thermo" tank and bulk liquid carbon dioxide transfer is performed using a separate "solvent" tank. The thermo tank stores liquid carbon dioxide and uses its vapors primarily for pressure equalization with the cleaning vessel. It is not used to store liquid carbon dioxide for its transfer to the cleaning vessel. Preston et al. fails to anticipate each and every element of the claimed invention. Preston et al. includes having one or two storage tanks for transferring liquid solvent into a cleaning chamber and a separate transfer tank, which is used to transfer liquid carbon dioxide into the storage tank(s). Thus, Preston et al. fails to anticipate using the combination of only one "thermo" tank for pressure equalization and one "solvent" tank for storing and transferring liquid carbon dioxide to the cleaning vessel.

The temperature in the "thermo" tank is allowed to fluctuate as the "thermo" tank pressure equalizes with that of the cleaning vessel or as vapor is recovered from the cleaning vessel subsequent to a cleaning cycle. The particular feature of the first storage vessel having significant variability in temperature is distinguishable from the features in the method of Preston et al. Thus, the pressure equalization step entails novel features inherent in the method of the present invention, which Preston et al. fails to anticipate.

Additionally, since the cleaning vessel internal pressure has been raised through equalization with the "thermo" tank, it is close to that of the "solvent" tank. Thus, any remaining pressure

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differential between the cleaning vessel and the "solvent" tank will not result in significant temperature drop in the "solvent" tank contents. Consequently, the bulk liquid carbon dioxide transferred to the cleaning vessel from the "solvent" tank does not require thermal adjustment for optimal cleaning performance. In contrast, the system of Preston et al. relies on a simple back and forth exchange of bulk liquid carbon dioxide between storage tanks, resulting in the need to provide external thermal adjustment means.

Preston et al. cannot anticipate each and every element of the claimed invention. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the foregoing rejection.

Claim Rejections - 35 U.S.C. §103

Claim 18 is rejected under 35 U.S.C. §103(a) as being obvious over Preston et al. in view of Roberts et al. (U.S. Patent 5,850,747).

Applicant respectfully traverses the foregoing rejection.

Claim 18 is considered allowable as being dependent on an allowable base claim, per the argument raised above. Additionally, claim 18 recites the steps of evacuating gaseous dry cleaning medium by conducting the gaseous dry-cleaning medium through a heat exchanging conduit disposed within the cleaning vessel. Preston et al., in contrast, utilizes a refrigeration circuit for cooling liquid carbon dioxide going into the cleaning vessel.

Roberts et al. fails to cure the deficiencies found in Preston et al. The Examiner indicates that Roberts et al. teaches using "a heat exchanger inside a dry-cleaning washing

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vessel/chamber 'to prevent the interior temperature from descending below a prohibitively low level' during a 'vapor recovery cycle.'" Assuming *arguendo* that Roberts et al. teaches all other aspects of the invention, Roberts et al. teaches using latent heat from a compressor as a heat exchanger and mounts the compressor near the pressure chamber (see column 4, lines 5-10, in the '747 patent). Roberts et al. not only fails to teach or suggest the specific method steps for operating the dry-cleaning system of the invention but also fails to teach or suggest using a return line from the cleaning vessel back into the cleaning vessel where it forms a heat exchange coil. Roberts et al., either alone or in combination, with Preston et al. cannot make the claimed invention obvious or provide the teachings to an ordinary skilled artisan to practice the invention successfully. Applicant respectfully requests reconsideration and withdrawal of the foregoing rejection.

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WEINGARTEN, SCHURGIN,
GACNIBIN & LEBOVICI LLP
TEL. (617) 542-2290
FAX. (617) 431-0313

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CONCLUSION

Based on the foregoing, entry of the amendments and remarks presented herein, reconsideration and withdrawal of all the rejections and allowance of application with all pending claims are respectfully requested.

The Examiner is encouraged to telephone the undersigned attorney to discuss any matter that would expedite allowance of the present application.

Respectfully submitted,

DAVID N. BERGLUND

By: 
Gordon R. Moriarty
Registration No. 38,973
Attorney for Applicant(s)

WEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
Ten Post Office Square
Boston, MA 02109
Telephone: (617) 542-2290
Telecopier: (617) 451-0313

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Enclosures: Copies of English abstracts and titles for German
Patent 2027003, DE3904513, DE3904514, DE3906724,
DE3906735 and DE4004111.

293882-1

2027003
DA-3905

(54) Title: Process for cleaning soiled textile objects or soiled, oil-impregnated cleaning objects

The invention relates to the cleaning and treatment of oil-impregnated textile cleaning objects for the purpose of supplying the latter for renewed use. It relates, in particular, to oil-impregnated wipes or dust cloths and cleaning cloths.

In the household and in industry, the current tendency is to use rented or borrowed equipment, in which case the supplier of this equipment is responsible for maintenance and cleaning. It has been shown that shops, factories, hospitals, office buildings and the like can be kept clean more easily if the walls, floors, light fixtures and the like are freed of dust using oil-impregnated cloths, rags, or wipes. The principal reason for the rapid dissemination of oil-impregnated devices lies in the fact that they circumvent the necessity of washing with water, and of cleaning. Washing with water leaves a film behind on the floor or on other surfaces if these surfaces are not wiped dry. This film in turn causes a dull appearance of these surfaces, and it can, in addition, render possible the spread of infections. Oil-impregnated cloths or wipes, however, leave no such film behind. An additional reason for the increasing use of oil-impregnated rags and wipes is their ability to pick up lint and dirt. In the course of cleaning, therefore, the dirt is picked up and removed and not merely smeared around, as is often the case when cleaning with water.

Claims

1. A process for cleaning soiled textile objects, especially soiled oil-impregnated cleaning objects, wherein the soiled objects are brought into contact with a petroleum mineral oil, the oil is moved, and excess oil is removed from the cleaned objects.

Method of disinfecting and/or sterilising

Patent Number: DE3904513
Publication date: 1990-08-16
Inventor(s): BUSCHMANN HANS-JUERGEN DR (DE); SCHOLLMAYER ECKHARD PROF DR (DE); KNITTEL DIERK (DE); KOSFELD ROBERT PROF DR (DE)
Applicant(s): OEFFENTLICHE PRUEFSTELLE UND T (DE)
Requested Patent: ☐ DE3904513
Application Number: DE19893904513 19890215
Priority Number(s): DE19893904513 19890215
IPC Classification: A61L2/16; B65B55/02
EC Classification: A61L2/20, B65B55/10, A61L2/07, D06M23/10B
Equivalents:

Abstract

There is described a method of disinfecting and/or sterilising articles, especially medical devices and instruments, pharmaceutical materials, clean room articles, ampoules, packaging, surgical laundry, items of clothing or the like, in which these articles are treated with a fluid in an autoclave. The fluid used is a supercritical fluid.

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DE3904514 C2

Method for cleaning or washing articles of clothing or the like

A method is described for cleaning or washing articles of clothing, household textiles, carpets or the like, these items being treated in a cleaning or washing medium, optionally with the use of mechanical action, in order to remove stains, wherein the cleaning or washing medium used is a supercritical fluid, and that the cleaning or washing is performed at a temperature between approximately 20 °C and approximately 240 °C, and/or at a pressure between approximately $74 \cdot 10^5$ Pa and approximately $400 \cdot 10^5$ Pa.

Method for cleaning or washing articles of clothing or the like

Patent Number: DE3904514
Publication date: 1990-08-23
Inventor(s): BUSCHMANN HANS-JUERGEN DR (DE); SCHOLLMAYER ECKHARD PROF DR (DE); KNITTEL DIERK (DE); KOSFELD ROBERT PROF DR (DE)
Applicant(s): OEFFENTLICHE PRUEFSTELLE UND T (DE)
Requested Patent: ☐ DE3904514
Application Number: DE19893904514 19890215
Priority Number(s): DE19893904514 19890215
IPC Classification: D06F35/00; D06L1/00
EC Classification: D06F35/00, D06L1/00, C11D11/00B14, D06F43/00D, D06F43/08, D06M23/10B
Equivalents:

Abstract

A method is described for cleaning or washing articles of clothing, household textiles, carpets or the like, these being treated in a cleaning or washing medium in order to remove stains, if appropriate under the influence of a mechanical action. The cleaning or washing medium used here is a supercritical fluid.

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Dyeing process

Patent Number: DE3906724
Publication date: 1990-09-13
Inventor(s): BUSCHMANN HANS-JUERGEN DR (DE); SCHNEIDER GERHARD M PROF DR (DE); SCHOLLMAYER ECKHARD PROF DR (DE); KNITTEL DIERK (DE); PULAKIS KONSTANTINOS (DE)
Applicant(s): DEUTSCHES TEXTILFORSCHZENTRUM (DE)
Requested Patent: ☐ DE3906724
Application Number: DE19893906724 19890303
Priority Number(s): DE19893906724 19890303
IPC Classification: D06P1/00; D06P1/16; D06P1/90; D06P3/54
EC Classification: D06P1/90B, D06P3/54, D06M23/10B, D06P1/00Z
Equivalents:

Abstract

Described is a process for dyeing textile substrates wherein the substrates are subjected to the superficial or penetrative flow of a fluid which contains the dye or dyes. The fluid used is a supercritical fluid.

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Process for bleaching

Patent Number: DE3906735
Publication date: 1990-09-06
Inventor(s): BUSCHMANN HANS-JUERGEN DR (DE); SCHOLLMAYER ECKHARD PROF DR (DE); KNITTEL DIERK (DE)
Applicant(s): DEUTSCHES TEXTILFORSCHZENTRUM (DE)
Requested Patent: ☐ DE3906735
Application Number: DE19893906735 19890303
Priority Number(s): DE19893906735 19890303
IPC Classification: D06L3/00
EC Classification: D06L3/00, D06L3/02, D06L3/06, D06L3/10, D06M23/10B
Equivalents:

Abstract

Described is a process for bleaching silk, wool, linen and/or cellulose fibre materials by treating the materials with a fluid containing bleaching chemicals. The fluid used is a supercritical fluid.

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Removing accompanying material from flat textiles - threads or animal hair by treatment with supercritical fluid

Patent Number: DE4004111
Publication date: 1990-08-23
Inventor(s): BUSCHMANN HANS-JUERGEN DR (DE); KNITTEL DIERK (DE); SCHOLLMAYER ECKHARD DR RER NAT (DE)
Applicant(s): DEUTSCHES TEXTILFORSCHZENTRUM (DE)
Requested Patent: ☐ DE4004111
Application Number: DE19904004111 19900210
Priority Number(s): DE19904004111 19900210; DE19893904515 19890215
IPC Classification: D06B19/00; D06L1/00; D06L1/06; D06L1/18; D06M11/46; D06M11/61; D06M13/02; D06M13/08
EC Classification: D06L1/00, D06L1/06, D06M11/76, D06M13/02, D06P1/90B2, D06P1/90B4, D06B19/00, D06F43/00D, D06M23/10B
Equivalents:

Abstract

Textile flat goods, threads or animal hair are pre-treated with a supercritical fluid, to remove accompanying material.

Pre-treatment is for 0.5-60 (2-15) mins, at 8-250 (31-197 deg C and 30-300 bars, using as fluid alkanes, NH₃, fluorochloro-alkanes, CO₂ and/or CO. Textile hair, esp raw wool, is treated with ethane, partic by passing the supercritical fluid through a pile of the hair, esp a press-cake.

ADVANTAGE - The accompanying materials (I), eg emulsifiers or sizes, are removed by a quick method which is economical in energy and forms no waste water. Solubility of (I) in the fluid is high, and (I) are easily removed from the fluid and can be processed and/or re-used. The goods do not have to be dried. Treatment of animal hair gives wool grease, for use in pharmacy and cosmetics. the fluid may be non-toxic; leakage does not then release poisonous substances into the atmos; any fluid adsorbed by the goods is easily removed by lowering the pressure or temp, or increasing the vol.

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